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Reading strategies activated in experimental research

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Abstract

In this study, we focus on findings of the experimental research targeted on selected learners from two primary schools. The experiment aims to contribute with new findings to the development of reading literacy and demonstrate the effectiveness of education using the Double-Entry Diary method to enhance the reading literacy level of the experimental group. Research methodology is quantitative-qualitative. The quantitative methods we employed were an experiment and standardized didactic test taken from PIRLS, a periodic international survey. The analysis of the pupils' reading diaries was conducted through a qualitative method. We used a selective sampling method. We monitored the level of reading skills based on PIRLS and their development in relation to the application of the Double-Entry Diary method.

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Keywords: Double-entry diary; reading literacy; text, reading; reading strategies

1. Introduction

Reading literacy is of a great interest to a number of Czech and world-wide experts in the field. This interest is fully justified considering the fact that it is a key literacy without which one cannot live effectively in today's society. The ability to decode information is a means to success in many fields of human life. This paper aims to introduce new findings of the experimental research looking into the effectiveness of employing the Interglossary method, based on Double-Entry Diary originated in the RWCT (Reading and Writing for Critical Thinking)

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International Consortium on the spectrum of reading skill groups. The sample consisted of 138 fourth-grade primary school learners divided into two groups – the control and experimental one.

2. Definition of terminology

The Double-Entry Diary method is a very important method developing fourth-grade primary school learners' reading skills, so far unfortunately undervalued in teaching. The method can also be applied at any higher level of education and due to its variability we may expect it to be effective also for learners with learning disabilities. This method originated in RWCT International Consortium (Reading and Writing for Critical Thinking) in 1997. The members of the consortium are International Reading Association, Hobart and William Smith College, and the University of Northern Iowa. This method enables learners to make records in a reading diary after individual silent reading in a literature lesson fostering learner's active learning and developing deeper understanding. Teaching experience shows that it leads to the development of reading skills, primarily to the spectrum of interpretation and integration skills.

The term Double-Entry Diary alludes to the type of recording resembling that in double entry book-keeping, i.e. two entries separated by a line. It represents a learner's specific way of making records in a reading diary. The method involves reading strategies therefore it is worth mentioning what the reading strategies are, how they can be classified and what results can be achieved through them in the educational process. For example, Susan Israel talks about the effectiveness of reading strategies for the development of the spectrum of reading skills: modelling, thinking aloud, inferring and deducing, linking, asking questions, predicting, etc. (Block and Israel, 2005; Israel 2007). Other authors talk about skimming, scanning, predicting, skipping unknown words, and critical reading strategies (Carell, 1998). Experts agree that reading strategies are part of the file of competencies learners need to use for effective reading. Reading strategies are procedures helping learners to comprehend the text better. Strategic is something that is conscious and thought-out. When using the strategies, we put a lot of emphasis on the process itself, in other words the way that helps us understand the content of the text. Learners use more than one strategy (Geary, 2006). The study by Schunk and Rice (1992) revealed that mastering reading strategies often helps learners to comprehend the text better. This applies mainly to learners with learning difficulties who struggle with organizing their thoughts or attention span.

3. Empirical part

3.1. Objectives

The research aimed to contribute with new findings of the experimental research to the development of reading literacy of all learners and to design an educational model reflecting the research findings leading to a more effective development of the reading literacy in the fourth grade in primary school.

3.2. Research metodology

The research methodology is quantitative-qualitative. The quantitative methods employed were an experiment and standardised didactic test taken from PIRL, a periodic international survey, in a pedagogical experiment. The evaluation of all didactic tests was examined by two trained independent evaluators. Qualitative method was used in the text analysis of the learners' reading diaries. Fourth-graders from two selected Prague primary schools were selected for the research. The level of their reading skills based on PIRLS and their development in connection with the use of the Double-Entry Diary method were monitored. The method is strictly defined. Its procedures are described in the handbook and made available to teachers. Selected interested teachers will be trained for this method through briefings, regular consultations, checks, and briefings with a handbook, in which evaluation variability, reactions and feedbacks will be detailed. To analyse the data obtained in the research, SPSS (Statistical Package for the Social Sciences) 12.0 version software and MS Excel application were used employing a pivot table, statistical functions, enabling graph inserting and editing, the presentation of which is more acceptable.

3.3. Research design

This research design is quasi-experimental. It has one independent variable and one dependent variable. The independent variable comprises the teaching method (Interglossary using Double-Entry Diary) whereas the dependent variable comprised a spectrum of reading skills consisting of 5 parts - overall comprehension, searching for information, drawing conclusions, text interpretation and integration and assessment.

3.4. Research tool

Standardised didactic test – test exercise book of the PIRLS international research. The evaluation criteria were taken from PIRLS based on the examples from the research and logic, sense and meaning of the text and responses. The evaluators were two trained people who followed the evaluation procedure throughout the whole research process. The maximum score for each test is 17. The questions could be evaluated by 1, 2, or 3 points according to the difficulty of the response. Two and more points appear in the questions requiring a response. Responses evaluated by one point had to contain all necessary elements required by the questions and they had to be precisely in accordance with the thoughts and information of the text to score a point. In questions evaluated by two points an option of full number of points or some points could occur. Full points could be achieved by learners showing full comprehension and the ability of inferring, deducing and interpretation in accordance with the text where these skills were required. The option of some points (one point) occurred when a learner showed only simple comprehension of the explicitly expressed information when the question required the use of inferring and deducing or interpretation.

3.5. Research sample

Due to time constrains and organisational and financial reasons, we could not work with a research population, which is a collection of all individuals targeted by the research. A research population our research focused on comprises Prague fourth-graders in compulsory schooling. The main research part involved a group of respondents with 138 learners. Sampling was done as convenience sampling (Gavora, 2000). In the Czech Republic, the school system is highly selective; it excludes gifted learners by moving them into six- or eight-year grammar schools. Since pupils change schools after completing the fifth grade, our sample will be complete.

Both selected schools teach languages from the 1st grade even though they are non-selective schools. They teach Informatics from the 1st grade as well. One of the schools offers also Music, however the pupils are not in split groups in other subjects and the time allocation for Czech Language is equal in both schools. These schools have a wide range of learners with different reading skills levels from pupils having no reading experience at all up to strong, advanced readers achieving top results. The classes comprised pupils with SAEP (Specially Adapted Educational Programme) due to learning disabilities, pupils with low socio-cultural standing, and pupils with behavioural problems. Two schools from Prague 4 District with three fourth-grade classes were selected for the research. One group consisted of three classes, with total of 69 pupils and it was used as an experimental group; the other group consisted of 69 pupils and it was considered as a control group. In order to ensure the identity of both groups (the experimental and control one) on the whole spectrum of the examined reading skills, we conducted a t-test on the data from the pre-test and compared the Mean and Standard deviation values for the control and experimental groups. The test did not show any significant difference between the control and experimental group on the spectrum of all reading skills before launching an experiment in employing the Interglossary method using Double-Entry Diary. This means that both groups were approximately at the same level of understanding the text at the beginning of the experiment.

Table 1. T-test experimental and control group

Report			
Points			
Ex/co group	Mean	N	Std. Deviation
1	9.51	69	3.956
2	9.03	69	3.941
Total	9.27	138	3.949

3.6. The process of the experiment

The experiment was phased into the following steps:

- An interview and agreement of the school leaders of both schools with the experiment in all fourth grade classes;
- selection of two independent experts, who became the evaluators of the tests;
- teachers were briefed on the research plan, trained and they obtained project materials, mainly a detailed description of the method with instructions how to use the method in class;
- pupils of both groups, the control and experimental one, were informed on the research background of the testing; the method of completing the test was explained to them, and they were asked to fill in the test best as they could
- a 40-minute pre-test;
- the analysis of the pre-test by means of a statistical test whether it is possible to compare both groups at all – t-test;
- teacher training, questions and answers, problem solving;
- launching the Interglossary method once a week October 2013 – April 2014 in the experimental group, whereas the control group follows a usual way of learning reading literacy;
- teacher training, questions and answers, problem solving, visiting schools;
- after the method has been implemented, the post-test follows in all fourth grade classes in both schools;
- test evaluation by two independent evaluators;
- expressing our thanks to school leaders and teachers;
- transcription, data cleaning, and analysis through statistical methods, comparing Mean and Standard deviation, using T-test to identify whether the differences between the groups were statistically significant (α=0,05) or not.

All tests were carried out on the level of significance $p < 0,05$. With regard to the method of sampling (intentional, convenience sampling), we do not intend to generalize the findings and draw conclusions for research population.

4. Findings

The research aimed to show the effectiveness of implementing the Double-Entry Diary method on the spectrum of reading skills of four strands. Strand A is a collection of reading skills called searching information, Strand B represents reading skills of drawing conclusions, Strand C identifies text interpretation and integration, and Strand D contains skills of assessing the type and content of text.

4.1. Hypotesis

H1: The experimental group achieved better results than the control group
H0: Average results of the experimental and control group do not differ

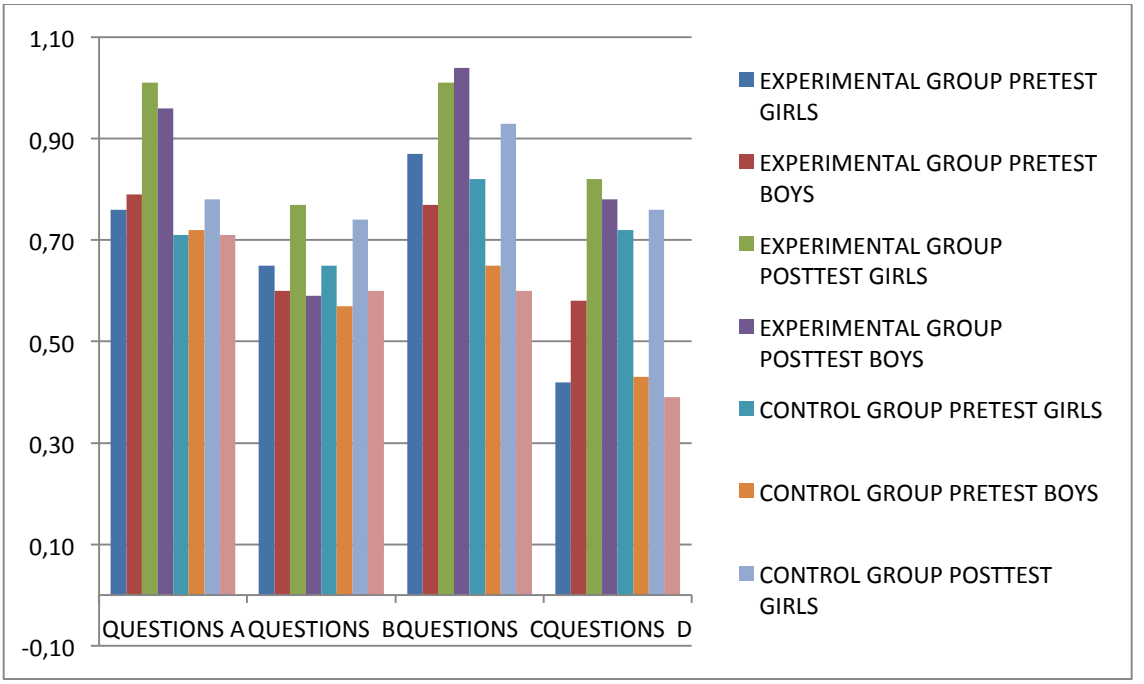
The following table compares the means of the results reached by the fourth-grade pupils of the experimental and control group from two primary schools.

Table 2. Comparing the means of points achieved by fourth-graders of the experimental and control group from two primary schools

SORTING FACTOR – GENDER/GROUP/TEST								
ANSWER	**EXPERIMENTAL GROUP**		**EXPERIMENTAL GROUP**		**CONTROL GROUP**		**CONTROL GROUP**	
	PRE-TEST		**POST-TEST**		**PRE-TEST**		**POST-TEST**	
	GIRL	**BOY**	**GIRL**	**BOY**	**GIRL**	**BOY**	**GIRL**	**BOY**
TOTAL	36	31	34	37	39	30	41	28
Questions A	**0.76**	**0.79**	**1.01**	**0.96**	**0.71**	**0.72**	**0.78**	**0.71**
Question 1A	0.64	0.65	0.85	0.81	0.85	0.67	0.90	0.50
Question 8A	0.89	0.94	1.18	1.11	0.56	0.77	0.66	0.93
Questions B	**0.65**	**0.60**	**0.77**	**0.59**	**0.65**	**0.57**	**0.74**	**0.60**
Question 2B	0.39	0.32	0.68	0.24	0.44	0.33	0.49	0.50
Question 3B	0.86	0.77	0.85	0.78	0.82	0.87	0.93	0.79
Question 4B	0.53	0.42	0.71	0.38	0.41	0.43	0.49	0.68
Question 5B	0.72	0.84	0.85	0.76	0.79	0.60	0.85	0.50
Question 7B	0.92	0.81	0.91	0.84	0.90	0.77	0.98	0.71
Question 9B	0.47	0.45	0.65	0.51	0.51	0.43	0.71	0.39
Questions C	**0.87**	**0.77**	**1.01**	**1.04**	**0.82**	**0.65**	**0.93**	**0.60**
Question 6C	0.67	0.71	0.82	0.84	0.77	0.60	0.76	0.57
Question 10C	1.28	1.00	1.65	1.62	1.08	0.67	1.27	0.68
Question 11C	0.89	0.87	1.00	1.14	0.85	0.73	1.02	0.50
Question 13C	0.64	0.48	0.59	0.57	0.59	0.60	0.66	0.64
Questions D	**0.42**	**0.58**	**0.82**	**0.78**	**0.72**	**0.43**	**0.76**	**0.39**
Question 12D	0.42	0.58	0.82	0.78	0.72	0.43	0.76	0.39

The graph clearly shows the distribution of the strands. In the experimental group, both girls and boys improved in the strand of searching information (A). Girls scored 16.7% higher and boys 11.3 % higher. In Questions B, the girls scored 12.6% higher but boys scored 1.7% lower in the strand of drawing conclusions. This was mainly caused by Questions 2, 4, and 5. In Questions 3, 7, and 9, boys slightly improved their performance. The most significant improvement was reached by girls; in Question 12, they scored 40.7% more. In Strand C (interpretation and integration of the text), the girls scored 8.4% more whereas boys scored even 15.3% more. The girls reached the biggest improvement in the strand of text evaluation (D) reaching 40.7%; the boys showed the improvement of 20.3%. The table indicates that the pupils in the experimental group reach a higher mean value of the test results than the pupils in the control group in the strand of overall text comprehension, as well as in all sub-strands. On the whole, we can conclude that girls achieved statistically significant improvement in the post-test (compared to the pre-test) of 13.3% at the significance level of 0.05.

Graph 1. compares the means of points achieved by fourth-graders of the experimental and control group from two primary schools



Boys achieved a 9.1% statistically significant improvement (compared to the pre-test) at the significance level of 0.05%. The difference in the success rate of the pupils of the experimental and control group is statistically significant in all strands of reading literacy – drawing conclusions, text interpretation and integration, and text evaluation. The conducted analyses therefore show that the results of the experimental group were better than the results of the control group. Statistically significant differences were found in all four strands of reading skills. By means of statistical induction we confirmed Hypothesis 1.

Table 3. Improvement and deterioration in the individual strands of reading skills

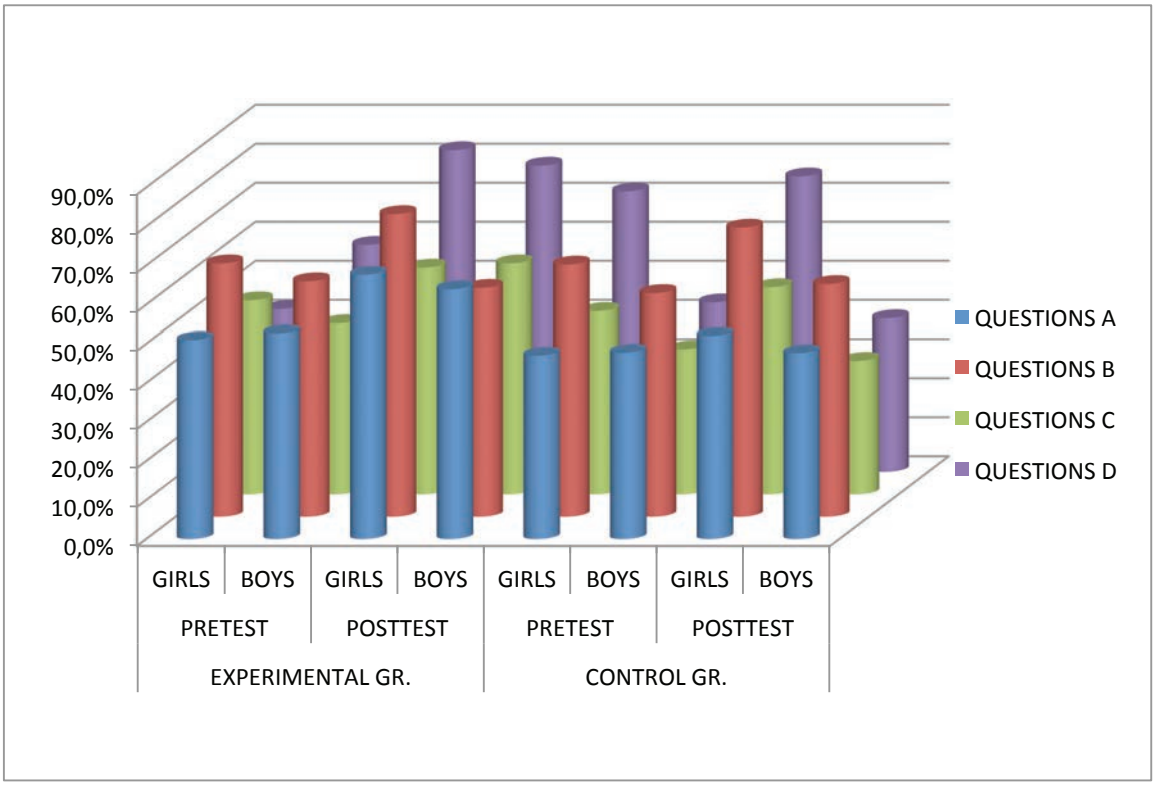
SORTING FACTOR – GENDER/GROUP/TEST						
ANSWER	**EXPERIMENTAL GROUP**		**EXPERIMENTAL GROUP**		**POST-TEST-PRE-TEST**	
	PRE-TEST		**POST-TEST**			
	GIRL	**BOY**	**GIRL**	**BOY**	**GIRLS**	**BOYS**
TOTAL	36	31	34	37		
Questions A	**50.9 %**	**52.7 %**	**67.7 %**	**64.0 %**	16.7 %	11.3 %
Question 1A	63.9 %	64.5 %	85.3 %	81.1 %	21.4 %	16.6 %
Question 8A	44.4 %	46.8 %	58.8 %	55.4 %	14.4 %	8.6 %
Questions B	**64.8 %**	**60.2 %**	**77.5 %**	**58.6 %**	12.6 %	-1.7 %
Question 2B	38.9 %	32.3 %	67.7 %	24.3 %	28.8 %	-7.9 %
Question 3B	86.1 %	77.4 %	85.3 %	78.4 %	-0.8 %	1.0 %

Question 4B	52.8 %	41.9 %	70.6 %	37.8 %	17.8 %	-4.1 %
Question 5B	72.2 %	83.9 %	85.3 %	75.7 %	13.1 %	-8.2 %
Question 7B	91.7 %	80.7 %	91.2 %	83.8 %	-0.5 %	3.1 %
Question 9B	47.2 %	45.2 %	64.7 %	51.4 %	17.5 %	6.2 %
Questions C	**49.6 %**	**43.8 %**	**58.0 %**	**59.1 %**	8.4 %	15.3 %
Question 6C	42.6 %	33.3 %	54.9 %	54.1 %	12.3 %	20.7 %
Question 10C	66.7 %	71.0 %	82.4 %	83.8 %	15.7 %	12.8 %
Question 11C	44.4 %	43.6 %	50.0 %	55.4 %	5.6 %	11.9 %
Question 13C	63.9 %	48.4 %	58.8 %	56.8 %	-5.1 %	8.4 %
Questions D	**41.7 %**	**58.1 %**	**82.4 %**	**78.4 %**	40.7 %	20.3 %
Questions 12D	41.7 %	58.1 %	82.4 %	78.4 %	40.7 %	20.3 %
TOTAL	**54.7 %**	**52.0 %**	**68.0 %**	**61.1 %**	13.3 %	9.1 %

the basis for the mean % - the whole sample

*Positive number = improvement, *Negative number = deterioration

Graph 2. Comparing % improvement/deterioration of the control and experimental group pre-test/post-test



The graph clearly shows that the average success rate of the pupils of the experimental group was higher than that of the control group except for Strand B for boys, whose performance worsened by 1.7%. Yet we need to ask whether these differences are statistically significant. To compare the mean of the success rate of the experimental and control group we used a two-sample t-test. In this case, the null hypothesis says that there is no difference between the values of the experimental and control group. The table demonstrates that this difference is statistically

significant. Hence the performed analyses indicate that the results of the experimental group were better than those of the control group. Statistically significant differences were found in all four strands of reading skills. The difference in the success rate of the pupils of the experimental and control group is statistically significant in all strands of reading literacy - drawing conclusions, text interpretation and integration, and text evaluation. By means of statistical induction we confirmed Hypothesis 1.

4. Conclusion

While respecting its procedures, the Interglossary method using the Double-Entry Diary helps teachers to enhance pupils' level of reading literacy systematically without studying the theory extensively. The regular implementation of this method into the learning process makes it a useful tool for pupils' reading literacy development. The research findings led me to suggest recommendations to implement the teaching of reading strategies into reading lessons, particularly asking questions before, during, and after reading, the strategies of comparing, explaining, reasoning, agreeing, disagreeing, predicting, generalizing, summarising, inferring and deducing, assessing, evaluating, linking, and modelling, and to use them as variously as possible. I encourage teachers to use longer children's books rather than shorter texts in textbooks, silent reading, and to allow for individual choice of literature.

The research showed that the Double-Entry Diary method enhances the success rate of testing reading skills of searching information, drawing conclusions, text evaluation, but in particular the text interpretation and integration. According to the international surveys (PISA 2009), these were the areas, in which Czech pupils were lagging behind.

The findings led me to the following recommendations for teachers involved in teaching reading literacy:

1) Draw pupils' attention and create a silent learning environment
2) Develop a broad vocabulary
3) Offer pupils the widest possible range of texts
4) Provide motivating texts and context
5) Teach reading strategies
6) Allow for discussions and conduct them
7) Link reading and writing
8) Continuously monitor and evaluate progress
9) Individualise reading tasks

Reading literacy is a comprehensive competence requiring active thinking while reading. Without that reading is doomed to be ineffective.

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